Claims

Please note the listing of the claims as follows. As no claims are amended, added or canceled; this listing is identical to the most recent listing of claims.

1. (Canceled)

2. (Previously Presented)A method for removing line-like defects from an image by providing image data in digital form, analyzing segments of the image data as groups of pixels, detecting line defects in the image by application of a local radial angular transform and adjusting the image data to correct the detected line defects.

3. (Canceled)

4. (Original) The method of claim 2 in which the detecting operation detects a line according to at least one characteristic from the group comprising line lightness higher than the surroundings, line lightness lower than the surroundings, line contrast with respect to surroundings, line orientation with respect to the image borders, line edge sharpness, line width or line length.

5. (Canceled)

6. (Original) The method of claim 2 wherein the image is a color image.

7. (Canceled)

8. (Original) The method of claim 2 wherein the image data is provided in a color space format that includes a brightness value.

9. (Original) The method of claim 2 wherein a geometric pattern of groups of pixels is selected and used to detect line-like structures in image data.

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10. (Original) The method of claim 9 wherein the geometric pattern comprises hexons.

11. (Original) The method of claim 8 wherein a geometric pattern of groups of pixels is selected and used to detect line-like structures in image data.

12. (Original) The method of claim 11 wherein the geometric pattern comprises hexons.

13. (Previously presented) The method of claim 10 wherein the hexons are laid over the image.

14. (Previously presented) The method of claim 13 wherein a modulus of a transformation coefficient, c_3, is used to indicate the presence of a line-like feature in the image under the hexon.

15. (Original) The method of claim 9 wherein brightness differences within the groups of pixels are used to identify line-like features.

16. (Previously presented) The method of claim 2 wherein an operator selects a type of line defect to be corrected by selecting from among the group consisting of a) light line defects, b) dark line defects, and c) both light line defects and dark line defects.

17. (Previously Presented) A method of correcting line-like defects in a single still image without requiring the defects to be manually delineated, the method comprising providing image data in digital form, analyzing segments of the image data as groups of pixels, automatically detecting line defects in the image using a local radial angular transform, and adjusting the image data to correct the detected line defects.

18. (Canceled)

19. (Original) The method of claim 17 wherein automatically detecting defects in the image is determined by a program which analyzes for line-like patterns and their

relative darkness or lightness with respect to surrounding pixels or surrounding pixel groups.

20. (Original) The method of claim 17 wherein automatically detecting defects in the image is determined by a program which analyzes for line-like patterns and their contrast with respect to the surroundings.

21. (Original) The method of claim 2 wherein an operator adjusts two contrast limits L_1 and L_2 to restrict what regions of the image are to be selected as a defect area.

22. (Previously Presented) The method of claim 2 wherein only values of a lines strength metric, $|c_3|$, satisfying the relationship $L_1 \leq |c_3| \leq L_2$, where $0 < L_1 < L_2 \leq |c_3|_{max}$, are considered to represent a defect, wherein L_1 defines a lower contrast limit and L_2 defines an upper contrast limit.

23. (Canceled)

24. (Original) The method of claim 2 wherein the operator marks a selected area of the image on which to practice the method.

25. (Original) The method of claim 2 wherein a threshold value to determine limits on detected line defects to be treated is applied to data from application of a local radial angular transform.

26. (Canceled)

27. (Original) A computer containing software and hardware that enables execution of the process of claim 2.

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Previously presented) A method for removing line defects from a still image by providing image data in digital form, detecting line defects in the image of a specified range of sharpness without manually designating the spatial location of the line defects, and adjusting the image data to correct the detected line.

32. (Previously presented) A computer program product readable by a computer system for executing a computer process that removes line-like defects from an image by providing image data in digital form, analyzing segments of the image data as groups of pixels, detecting line defects in the image by application of a local radial angular transform and adjusting the image data to correct the detected line defects.

33. (Previously presented) A computer program product readable by a computer system for executing a computer process that corrects line-like defects in a single still image without requiring the defects to be manually delineated, the computer process comprising providing image data in digital form, analyzing segments of the image data as groups of pixels, automatically detecting line defects in the image using a local radial angular transform, and adjusting the image data to correct the detected line defects.

34. (Previously Presented) A computer program product readable by a computer system for executing a computer process that removes line defects from a still image by providing image data in digital form, detecting line defects in the image of a specified range of sharpness without manually designating spatial locations of the line defects, and adjusting the image data to correct the detected line defects.

35. (Previously presented) A method of removing a defect from a digital image, the method comprising:

defining a geometric pattern of pixel groups in the digital image;

determining a brightness vector representing mean brightness values associated with each of the pixel groups;

determining local radial angular transform coefficients based on the brightness vector;

identifying a presence of a defect within the geometric pattern based on at least one of the local radial angular transform coefficients; and

adjusting digital image data of the defect to remove the defect from the digital image.

36. (Previously presented) The method of claim 35 wherein the at least one of the local radial angular transform coefficients has a non-zero imaginary component and a non-zero real component.

37. (Previously presented) The method of claim 35 further comprising:

determining an angle of the defect using imaginary and real components of the at least one of the local radial angular transform coefficients.

38. (Previously presented) The method of claim 35 wherein a defect has a defined type and further comprising:

evaluating a ratio of an imaginary component and a real component of the at least one of the local radial angular transform coefficients against a defined threshold to determine the defined type of the defect.

39. (Previously presented) The method of claim 35 wherein a defect has a defined type and further comprising:

evaluating a real component of the at least one of the local radial angular transform coefficients against a defined threshold to determine the defined type of the defect.

40. (Previously presented) A computer program product readable by a computer system for executing a computer process that removes a defect from a digital image, the method comprising:

defining a geometric pattern of pixel groups in the digital image;

determining a brightness vector representing mean brightness values associated with each of the pixel groups;

determining local radial angular transform coefficients based on the brightness vector;

identifying a presence of a defect within the geometric pattern based on at least one of the local radial angular transform coefficients; and

adjusting digital image data of the defect to remove the defect from the digital image.

41. (Previously presented) The computer program product of claim 40 wherein the at least one of the local radial angular transform coefficients has a non-zero imaginary component and a non-zero real component.

42. (Previously presented) The computer program product of claim 40 wherein the computer process further comprises:

determining an angle of the defect using imaginary and real components of the at least one of the local radial angular transform coefficients.

43. (Previously presented) The computer program product of claim 40 wherein a defect has a defined type and further comprising:

evaluating a ratio of an imaginary component and a real component of the at least one of the local radial angular transform coefficients against a defined threshold to determine the defined type of the defect.

44. (Previously presented) The computer program product of claim 40 wherein a defect has a defined type and further comprising:

evaluating a real component of the at least one of the local radial angular transform coefficients against a defined threshold to determine the defined type of the defect.

45. (Previously Presented) The method of claim 2 wherein a value resulting from the application of a local radial angular transform distinguishes the line defect from other line-like features.

46. (Previously Presented) The computer program product of claim 32 wherein a value resulting from the application of the local radial angular transform distinguishes the line defect from other line-like features.

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